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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/807,353	04/12/2001	Dharshini Chryshantha Fongalland	JMYT-234US	6310

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EXAMINER
MENON, KRISHNAN S

ART UNIT	PAPER NUMBER
1723	

DATE MAILED: 05/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/807,353	Applicant(s) FONGALLAND ET AL.4	
	Examiner Krishnan S Menon	Art Unit 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claims 1-20 are pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1,2,6-10,12,13, 17 and 18 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Stonehart et al (US 5,523,181)

Stonehart (181) teaches a substrate comprising a porous non-woven sheet of amorphous silica fibers (col 4 lines 15-34) bound by a binder (col 4 lines 47-54) as in instant claims 1 and 2 and having an ion-conducting polymer (col 4 lines 47-54) as in instant claims 8, for use in a composite membrane as in instant claim 9 (col 3 lines 43-53). The silica fibers are of 6-micron diameter as in instant claims 6 and 7 (col 4 lines 28-33).

Stonehart (181) teaches a composite membrane comprising a porous non-woven sheet of amorphous silica fibers (col 4 lines 15-34) bound by a binder (col 4 lines 47-54) and containing an ion-conducting polymer as in instant claim 10. Membrane thickness >200 microns as in instant claim 12 (col 5 lines 25-29). Use in fuel cell as in instant claim 13 (col 3 lines 43-53). The reference also teaches a membrane electrode assembly and a fuel cell as in instant claim 17 and 18 (col 3 lines 43-53; col 7 lines 1-13).

2. Claims 14, 15, 16 and 19 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Denton et al (US 6,042,958).

Denton (958) teaches a process for manufacture of a substrate comprising the steps of dispersing the mixed silica fibers (col 2 line 66- col 3 line 10) in water to form a slurry, depositing the slurry on a mesh bed to form a fiber network, applying the binder for impregnation and drying and compacting (col 6 lines 14-46) as in claim 14. The substrate then could be impregnated with an ion-conducting polymer as in claim 15 (col 6 lines 32-37). The impregnation may be carried out by using nip roller coating (calendaring) as in instant claim 16 (col 6 lines 14-25). The fibers are randomly oriented in the substrate as in instant claim 19 (col 6 lines 8-13).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 3-5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stonehart (181) in view of Denton (958).

Stonehart (181) teaches all the elements of instant claims 3-5 and 11 as in claims 1 and 10 above, except about the nature of silica fibers as chopped and/or microfibers as in instant claim 3, their proportion in the substrate as in instant claim 4 and 5, and testing the substrate in boiling water as in instant claim 11. Denton (958) teaches silica fibers and chopped and microfibers (col 3 lines 5-23, examples 2-5). It would be obvious to one of ordinary skill in the art at the time of invention to have the silica fibers as chopped or microfibers or a mix of the two as taught by Denton (958) in the teachings of Stonehart (181) as alternate but equivalent, for obtaining 3-dimensional stability (see Denton col 2 line 66 – col 3 line 9). As to their proportions, Stonehart (181) in view of Denton (958) does not teach what proportions they should be mixed. However, the range of mixing also would be obvious to one of ordinary skill in the art at the time of invention, as the proportion does not seem to be very important from the teachings of Denton (958) (working examples 2-4 do not provide any specific proportion indicating that the actual mix proportion is not important). [Re optimizing the mix proportions, "Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art". In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955).] As to the boiling water test as in instant claim 11, it would be obvious to one of ordinary skill in the art at the time of invention that the membrane as made by the process of Stonehart (181) should also test similarly and provide about 9% change in area.

2. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Denton (958) in view of Stonehart (181).

Denton teaches all the limitations of claim 14 above. Claim 20 has added limitation of the amorphous silica fibers being microfine fibers and chopped fibers. Denton teaches microfine glass fibers and chopped glass fibbers in the examples, but does not specifically teach microfine and chopped silica fibers. Stonehart teaches the use of silica fibers for the substrate and membrane (col 4 lines 5-9) for ion conducting membranes. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Stonehart in the teaching of Denton to have microfine fibers and chopped fibers for 3-dimensional stability as taught by Denton (col 2 line 66 – col 3 line 10), and of silica for stabilizing conductivity as taught by Stonehart (col 4 lines 5-9).

Response to Arguments

Argument that the Stonehart ref has silica fibers distributed evenly: The claims read '...a porous non-woven sheet ... of fibers..'. Stonehart teaches a porous non-woven sheet of fibers, since the fibers are randomly distributed as in non-woven (vs. orderly oriented in a repeating pattern as in woven). Stonehart teaches membrane with silica evenly distributed. Claims do not have the limitation that the fibers are 'unevenly' distributed to overcome the ref. Stonehart teaches a 'non-woven fiber sheet' having a binder and an ion-conducting polymer as his membrane.

Argument that Stonehart has silica for water retention: This intent of Stonehart does not negate the ability of the fibers to provide dimensional stability. The express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. "The inherent teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness." In re Napier, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) (affirmed a 35 U.S.C. 103 rejection based in part on inherent disclosure in one of the references). See also In re Grasselli, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983).

Argument that Denton ref does not teach silica: See col 2 line 66 – col 3 line 23 of Denton, where he describes the need for the different fibers and their dimensions for dimensional stability, and the different materials to be used. Denton may be teaching his invention with glass and quartz as examples, but does teach silica as a candidate. "Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments". In re *Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). The applicant agrees that silica is added for dimensional stability. Denton teaches materials and their dimensions for the membrane.

Argument about the distinction of silica from quartz, etc: Applicant does not show that the use of silica imparts a superior property to the membrane, other than dimensional stability which Denton teaches, to show that 'mixed amorphous silica' is non-obvious from Denton's list of choices.

Argument about Denton's teaching of coated fibers: Col 5 lines 18-23 of Denton teach coating fibers to tailor the characteristics for specific applications. Additional embodiments presented in a reference do not negate the ref as a prior art. Re amorphous silica, the referenced lines (col 5 lines 28-32) only show that Denton teaches use of amorphous silica also, if one desires increased hydrophilicity in addition to dimensional stability.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the

THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan Menon
Patent Examiner
May 19, 2003

W. L. WALKER
SUPERVISORY PATENT EXAMINER
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